General

Guideline Title

Cancer screening.

Bibliographic Source(s)

University of Michigan Health System. Cancer screening. Ann Arbor (MI): University of Michigan Health System; 2012 Oct. 18 p. [21 references]

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: University of Michigan Health System. Cancer screening. Ann Arbor (MI): University of Michigan Health System; 2011 Nov. 17 p. [21 references]

The University of Michigan Health System released a minor revision in December 2014 to include information about stool DNA testing, which was approved as a colorectal screening tool by the U.S. Food and Drug Administration after the October 2012 publication of this guideline.

Recommendations

Major Recommendations

Note from the University of Michigan Health System (UMHS) and the National Guideline Clearinghouse (NGC): The following guidance was current as of October 2012. Because UMHS occasionally releases minor revisions to its guidance based on new information, users may wish to consult the original guideline document for the most current version.

Note from NGC: The following key points summarize the content of the guideline. Refer to the full text of the original guideline document for detailed information on each of the screening procedures.

The strength of recommendation (I-III) and levels of evidence (A-D) are defined at the end of the "Major Recommendations" field.

Breast Cancer Screening

Modalities

Mammography with or without clinical breast exam.

Current Controversies

Whether to screen women ages 40-49.

Initiate

Average Risk

Routine screening mammography should be offered to women ages 50-74 *[IA]*. For women ages 40-49, two nationally recognized recommendations are:

- The American Cancer Society (ACS) and the National Comprehensive Cancer Network (NCCN) recommend beginning screening at age 40 years for average-risk women *[IIB]*.
- US Preventive Services Task Force (USPSTF) recommends that beginning screening before the age of 50 years should be an individual decision that takes patient context into account, including the patient's values regarding specific benefits and harms. For women ages 40-49 use shared decision making, including a discussion of the potential benefits and risks of screening mammography *[IB]*.

High Risk

Women at increased risk of breast cancer may benefit from earlier screening and discussion of risk reduction strategies (see Tables 2–3 in the original guideline document) *[IIB]*.

Frequency

For average-risk women, ACS and NCNN recommend screening every year; USPSTF recommends screening every two years *[IIC]*. For high risk, see Table 3 in the original guideline document.

Terminate

Consider continuing screening over age 74 only if life expectancy >10 years *[IIB]*.

Cervical Cancer Screening

Modalities

Liquid-based cervical cytology (ThinPrep®) and conventional Papanicolaou (Pap) smear of cervical cells are acceptable for screening. Co-testing using a combination of cytology (Pap) and human papillomavirus deoxyribonucleic acid (HPV DNA) testing may be appropriate for women older than 30 years.

Initiate

Start screening at age 21 *[IB]*, including women who have received the HPV vaccine *[IC]*. Screening is not indicated for women who have undergone a total hysterectomy for benign indications and do not have a prior history of cervical cancer or its precursors *[IIIB]*.

Frequency

Average Risk

In women aged:

- <21 years, do not screen
- 21-29 years, cytology screen every 3 years
- ≥30 years, screen either every 3 years with cytology or every 5 years with combination cytology and HPV testing *[1B]*

High Risk

For women with initial concurrent HPV-positive and cytology-negative screening results, HPV and cytology retesting is recommended in 12 months rather than immediate colposcopy *[IID]*. When available, HPV genotype-specific testing for HPV 16 or HPV 16/18 may be performed for women who are cytology negative and HPV-positive. For women treated for cervical intraepithelial neoplasia grade 2/3 (CIN 2 or CIN 3), if surveillance testing (usually cytology 6 months post treatment) is negative, regular screening resumes, as for average-risk women *[1C]*. More frequent screening, usually annual cytology, with or without HPV testing, is recommended for women who are immunosuppressed, infected with human immunodeficiency virus (HIV), or were exposed to diethylstilbestrol (DES) in utero *[IC]*.

Terminate

Discontinue screening women past age 65 who are not at high risk for cervical cancer and who have three consecutive negative cytology results or

two consecutive negative co-tests within the 10 years before cessation of screening, with the most recent test occurring within the past 5 years *[1C]*. For women who have a history of CIN 2 or CIN 3, continue screening for at least 20 years after initial postoperative surveillance *[1C]*. For other high-risk women, screening continues until limited life expectancy no longer warrants *[1D]*.

Colorectal Cancer Screening

Modalities

Recommended modalities include: fecal occult-blood testing (including fecal immunohistochemical testing), flexible sigmoidoscopy, colonoscopy, or stool DNA test (digital rectal exam is not effective in screening for colorectal cancer).

Current Controversies

Newer technologies, such as computed tomography (CT), colonography (virtual colonoscopy), and stool genetic testing are not yet fully validated or recommended for average-risk patients.

Initiate (for asymptomatic patients)

Average Risk

Screening should begin at age 50 *[IB]*.

High Risk

Individuals at increased risk of colorectal cancer should undergo more aggressive screening. The age to begin screening varies with the nature of the increased risk – see Table 5 in the original guideline document *[IC]*.

Frequency

Average Risk

Screen with one of the following. The frequency of screening has not been fully evaluated in clinical trials.

- High-sensitivity fecal occult blood test (FOBT or immunohistochemical test) annually *[IA]*
- Flexible sigmoidoscopy every 5 years with high-sensitivity FOBT every 3 years *[IA]*
- Colonoscopy every 10 years *[IB]*
- Stool DNA testing (Cologuard) every 3 years. Note: Stool DNA testing includes fecal immunochemical testing along with testing for DNA mutations from colon dells. *[1A]*

High Risk

Screening frequency varies with the nature of the increased risk – see Table 5 in the original guideline document *[IC]*.

Terminate

Current guidelines suggest discontinuing screening at age 75 *[IB]*. Earlier termination may be considered based on comorbidities and shortened life expectancy.

Prostate Cancer Screening

Modalities

Prostate-specific antigen (PSA) and digital rectal examination (DRE).

Current Controversies

USPSTF recommends against PSA screening for average-risk men of all ages because the small potential benefit does not outweigh the significant potential harm *[IIIC]*. The ACS recommends discussing screening at age 50 for men at average risk. The American Society of Clinical Oncology recommends that for men with life expectancy >10 years, shared decision making occur because individuals may value some benefits over some harms *[IID]*.

Initiate

If prostate cancer screening is considered, an informed decision-making process should precede a decision to perform screening *[IA]*. Clinicians

should share decision making with men, giving information about the uncertainties, risks, and potential benefits of prostate cancer screening.

Average Risk

For men ages 50-74 with a life expectancy >10 years, clinicians may choose to initiate or not to initiate a shared decision-making discussion about routine screening with patients *[IIC]*.

When individual patients request PSA screening, clinicians should initiate a shared decision-making discussion *[IIC]*.

High Risk

For African-American men and men with a family history of prostate cancer, provide information and discuss PSA screening starting at age 40 *[IIC]*.

Frequency

If performed, prostate cancer detection rates are similar for screening frequency intervals of 1 to 4 years *[IIB]*.

Terminate

If performed, stop screening at age 75, or when life expectancy is <10 years based on age and health status *[IID]*.

Definitions:

Levels of Evidence

A. Randomized controlled trials
B. Controlled trials, no randomization
C. Observational trials
D. Opinion of expert panel

Strength of Recommendation

I. Generally should be performed
II. May be reasonable to perform
III. Generally should not be performed

Clinical Algorithm(s)

None provided

Scope

Disease/Condition(s)

- Breast cancer
- Cervical cancer
- Colorectal cancer
- Prostate cancer

Guideline Category

Prevention

Risk Assessment

Screening

Clinical Specialty

Family Practice

Gastroenterology

Geriatrics

Internal Medicine

Obstetrics and Gynecology

Oncology

Preventive Medicine

Radiology

Urology

Intended Users

Advanced Practice Nurses

Physician Assistants

Physicians

Guideline Objective(s)

To implement an evidenced-based strategy for screening adults for cancers of the breast, cervix, colon, and prostate

Target Population

Adults, 18 years and older

Interventions and Practices Considered

Breast Cancer Screening

Routine screening mammography (with or without clinical breast exam)

Cervical Cancer Screening

1. Liquid-based cervical cytology (e.g., ThinPrep®) and conventional Papanicolaou (Pap) smear of cervical cells
2. Co-testing using a combination of cytology (Pap) and human papillomavirus deoxyribonucleic acid (HPV DNA) testing

Colorectal Cancer Screening

1. Fecal occult-blood testing (including fecal immunohistochemical testing), flexible sigmoidoscopy, colonoscopy, or stool DNA test (digital rectal exam is not effective)
2. Computed tomography (CT) colonography and stool genetic testing (not recommended for average-risk patients)

Prostate Cancer Screening

Prostate-specific antigen (PSA) and digital rectal examination for men ages 50-74

Major Outcomes Considered

- Risk of breast, cervical, colorectal, or prostate cancer
- Treatment induced morbidity and mortality
- Progression to metastases or invasive cancers
- Years of life gained
- Sensitivity, specificity, predictive value, validity of screening tests
- Cost-effectiveness of screening tests

Methodology

Methods Used to Collect/Select the Evidence

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

The literature searches for the previous versions of this guideline were conducted prospectively on Medline. However, in preparing to perform the search to update this guideline the guideline team learned of the ongoing literature surveillance performed by the National Cancer Institute (NCI). NCI performs monthly literature searches of PubMed for the PDQ® (Physician Data Query) Cancer Information Summaries on Screening and Detection (www.cancer.gov/cancertopics/pdq/screening). The updated information is reviewed in meetings of the PDQ® Screening and Prevention Editorial Board (www.cancer.gov/cancertopics/pdq/screening-prevention-board) every other month, with information added to the online summaries shortly thereafter. The guideline team requested and received from the Editorial Board Manager a copy of the search strategies they use for cancer screening literature. In summary the major search terms are: screening, risk, morbidity, exclusionary terms for biological research and treatment, and English language. These terms are used for the specific topics of breast neoplasms, cervix neoplasms, colorectal cancer, and prostate cancer. After reviewing the NCI search strategy and the reporting of results in PDQ® summaries, the guideline team accepted their strategy and results as the literature search the team would use to update this guideline. The results available in the online summaries as of June 2010 were used. The guideline team supplemented the NCI searches with very recent clinical trials known to expert members of the guideline team and its consultants.

The NCI searches are conducted in components each keyed to a specific causal link in a formal problem structure. The NCI searches are single cycle.

Number of Source Documents

Not stated

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Levels of Evidence reflect the best available literature in support of an intervention or test:

A. Randomized controlled trials
B. Controlled trials, no randomization
C. Observational trials
D. Opinion of expert panel

Methods Used to Analyze the Evidence

Systematic Review

Description of the Methods Used to Analyze the Evidence

Not stated

Methods Used to Formulate the Recommendations

Expert Consensus

Description of Methods Used to Formulate the Recommendations

Conclusions were based on prospective randomized controlled trials (RCTs) if available, to the exclusion of other data; if RCTs were not available, observational studies were admitted to consideration. If no such data were available for a given link in the problem formulation, expert opinion was used to estimate effect size.

Rating Scheme for the Strength of the Recommendations

Strength of Recommendation

I. Generally should be performed
II. May be reasonable to perform
III. Generally should not be performed

Cost Analysis

Breast Cancer

Screening women over age 74. Cost-effectiveness may decrease by age 75 to 80, due to lower life expectancy and over-diagnosis (since screening detects clinically insignificant cancers).

Use of magnetic resonance imaging (MRI). Due to the cost of MRI and its lack of demonstrated efficacy (defined as improved early breast cancer diagnosis with reductions in mortality rate), MRI should not be used for screening except in the highest risk.

Colorectal Cancer

Cost-effectiveness of screening. Several models using different approaches to simulate costs and effectiveness of colorectal cancer screening have been published. Under a variety of baseline assumptions, screening for colorectal cancer is cost-effective when compared to other commonly accepted medical interventions.

Screening people at higher risk. Screening people at higher risk of colorectal cancer is likely to be more effective and cost-effective than screening the general population.

Method of Guideline Validation

Internal Peer Review

Description of Method of Guideline Validation

Drafts of this guideline were reviewed in clinical conferences and by distribution for comment within departments and divisions of the University of

Michigan Medical School to which the content is most relevant: Family Medicine, General Medicine, General Obstetrics & Gynecology, Breast Oncology, Breast Radiology, Gastroenterology, Gynecology Oncology, and Urology. The Executive Committee for Clinical Affairs of the University of Michigan Hospitals and Health Centers endorsed the final version.

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The type of supporting evidence is identified and graded for each recommendation (see the "Major Recommendations" field).

Conclusions were based on prospective randomized controlled trials (RCTs) if available, to the exclusion of other data; if RCTs were not available, observational studies were admitted to consideration. If no such data were available for a given link in the problem formulation, expert opinion was used to estimate effect size.

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

Appropriate screening for breast, cervical, colorectal, and prostate cancer

Potential Harms

Breast Cancer Screening

The potential harms are primarily associated with false positive readings. They necessitate further evaluation with additional imaging studies and biopsies, and have been shown to increase anxiety and psychological distress. Also, a small possibility exists for radiation from mammograms to cause breast cancer. Annual mammography of 100,000 women for 10 consecutive years, beginning at age 40, is estimated to result in up to 8 radiation-induced breast cancer deaths.

Cervical Cancer Screening

Potential harms of human papillomavirus (HPV) co-testing include prolonged surveillance with additional frequent testing if the HPV is persistently positive.

Colorectal Cancer Screening

The United States Preventive Services Task Force (USPSTF) recommends against screening people over age 75, as the harms, such as colonic perforation or complications of preparation, may outweigh the benefits.

Prostate Cancer Screening

By detecting some prostate cancers that would never cause significant clinical problems, screening leads to both over-diagnosis and over-treatment. Subsequent treatment for prostate cancer with surgery or radiation can have permanent side effects, including sexual dysfunction and urinary incontinence, as well as a small risk of treatment-induced mortality.

Qualifying Statements

Qualifying Statements

These guidelines should not be construed as including all proper methods of care or excluding other acceptable methods of care reasonably directed to obtaining the same results. The ultimate judgment regarding any specific clinical procedure or treatment must be made by the physician

in light of the circumstances presented by the patient.

Implementation of the Guideline

Description of Implementation Strategy

An implementation strategy was not provided.

Implementation Tools

Staff Training/Competency Material

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Staying Healthy

IOM Domain

Effectiveness

Patient-centeredness

Identifying Information and Availability

Bibliographic Source(s)

University of Michigan Health System. Cancer screening. Ann Arbor (MI): University of Michigan Health System; 2012 Oct. 18 p. [21 references]

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

2004 May (revised 2012 Oct)

Guideline Developer(s)

University of Michigan Health System - Academic Institution

Source(s) of Funding

University of Michigan Health System

Guideline Committee

Adult Cancer Screening Guideline Team

Composition of Group That Authored the Guideline

Team Members: Breast Screening—Connie J Standiford, MD, General Medicine; Cervical Screening—Uche D George-Nwogu, MD, Family Medicine; Colorectal Screening—Sandeep Vijan, MD, General Medicine; Prostate Screening—Karl T Rew, MD, Family Medicine; R Van Harrison, PhD, Medical Education

Consultants: Barbara S. Apgar, MD; Daniel F Hayes, MD, Breast Oncology; Mark A Helvie, MD, Breast Radiology; James E Montie, MD, Urology; Anthony W Opipari, MD, Obstetrics and Gynecology; Philip S Schoenfeld, MD, Gastroenterology

UMHS Guidelines Oversight Team: Connie J Standiford, MD; Grant Greenberg, MD, MA, MHSA; R Van Harrison, PhD

Financial Disclosures/Conflicts of Interest

The University of Michigan Health System endorses the Guidelines of the Association of American Medical Colleges and the Standards of the Accreditation Council for Continuing Medical Education that the individuals who present educational activities disclose significant relationships with commercial companies whose products or services are discussed. Disclosure of a relationship is not intended to suggest bias in the information presented, but is made to provide readers with information that might be of potential importance to their evaluation of the information.

Team Member/Consultant	Relationship	Company
Barbara S. Apgar, MD	(none)	
Uche D George-Nwogu, MD	(none)	
R Van Harrison, PhD	(none)	
Daniel F Hayes, MD	(none)	
Mark A Helvie, MD	(none)	
James E Montie, MD	(none)	
Anthony W Opipari, MD	(none)	
Karl T Rew, MD	(none)	
Philip S Schoenfeld, MD	(none)	
Connie J Standiford, MD	(none)	
Sandeep Vijan, MD	(none)	

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: University of Michigan Health System. Cancer screening. Ann Arbor (MI): University of Michigan Health System; 2011 Nov. 17 p. [21 references]

The University of Michigan Health System released a minor revision in December 2014 to include information about stool DNA testing, which was approved as a colorectal screening tool by the U.S. Food and Drug Administration after the October 2012 publication of this guideline.

Guideline Availability

Electronic copies: Available from the University of Michigan Health System Web site .

Availability of Companion Documents

Continuing Medical Education (CME) information is available from the University of Michigan Health System Web site .

Patient Resources

None available

NGC Status

This NGC summary was completed by ECRI on October 12, 2004. The information was verified by the guideline developer on October 22, 2004. The NGC summary was updated by ECRI Institute on February 29, 2012. This NGC summary was updated by ECRI Institute on December 11, 2012. This summary was updated by ECRI Institute on January 2, 2015 following a minor revision released in December 2014.

Copyright Statement

Disclaimer

NGC Disclaimer